



The Laboratory Operating System



DEPUTY Labs Director Dave Douglass introduced a new management model, the Laboratory Operating System, during a June 13 all-hands meeting. (Photo by Randy Montoya)

A big step on the continuous improvement journey

By Amy Treece

A highly anticipated new management model known as the Laboratory Operating System, or LOS, was introduced to the Sandia community in an all-hands meeting on June 13. Deputy Labs Director Dave Douglass described LOS as a set of behaviors, processes, and tools that enable an engaged culture to operate effectively and deliver customer value.

Dave noted that the Sandia LOS is based on best practices from industry being tailored for a Federally Funded Research and Development Center by a cross-organizational steering committee appointed by the Labs’ senior leadership.

The members of the committee, Dave said, bring decades of collective experience at the Labs to the table, adding that their knowledge will help formulate the LOS for Sandia’s unique environment.

“This isn’t something we were told to do,” Dave said, “this is the right thing to do.” Honeywell, Sandia’s new parent company, has experienced great success using its own operating system since the early 2000s.

Josh Parsons, director of Business Excellence Center 10100, is heading up the LOS effort. In remarks at the all hands, he outlined the three essential elements of the system: an engaged culture, operational effectiveness, and customer value (see chart at top right).

“Those essential elements really tell you why we chose to embark on this journey,” he said. “But what it takes to make all of this work is people. They are the ones who integrate resources to achieve excellence in those areas.”

Embedded within the three essential elements are six enablers, or lean management tools and processes, being rolled out as a part of the LOS. They include strategy deployment, tiered accountability, data-driven and visual management, rapid problem solving, user experience, and velocity technology development.

Corporate Lean Six Sigma manager Rick Sherwood (10111), whose team is supporting the deployment of the LOS, noted in the all hands that “We’re starting with tiered accountability, which is a regular cadence of short 15-minute meetings enabling quick information-sharing up and down the organization. When the meetings are done right, they should identify and escalate issues and aid staff in obtaining the needed support to get things done.”

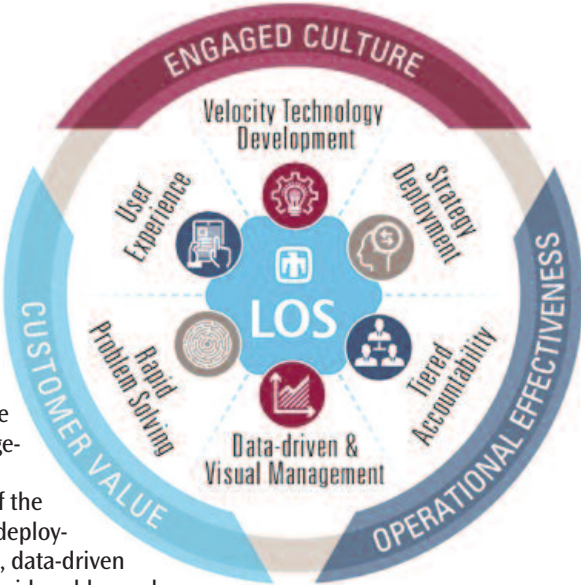
Tiered accountability boards will soon be going up all across the Labs’ campuses. Mission Services Div. 10000 Associate Labs Director Scott Aeilts noted that he is familiar with the boards from his experience at Honeywell.

“The boards give a quick status of each team’s priorities and the progress being made,” he said. “In my experience, they bring complications to light much more quickly and allow teams to be proactive in addressing them.”

The Tier 5 board used by Sandia Labs Director Steve Younger, Dave, and their staff members, went up on June 19.

Dave said he and Steve agree that the complete LOS deployment will take time and is another important step on Sandia Labs’ journey of continuous improvement.

“I know,” Dave said, “that our scientists and engineers would love a formula or equation that really helps identify how the LOS works. There isn’t a prescriptive answer. It isn’t just a set of tools. It involves employee empowerment and engagement, quick decision-making, and fast communication of issues resulting in rapid problem-solving. When we do all that well, one of the outcomes is that it becomes easier to do our jobs.”



Testing, testing Tonopah upgrades help Sandia testing

By Sue Major Holmes • Photos by Jim Galli

A former test director at Sandia’s Tonopah Test Range once described its combination of old and new tracking and data-collection equipment as like a mix of horseless carriages and horses — you can’t feed oats to the horseless carriages and you can’t gas up the horses.

It’s been a challenge for Tonopah to keep decades-old equipment running while gathering the detailed information required for 21st century non-nuclear testing. Over the past several years, the 60-year-old Nevada

(Continued on page 4)

NERVE CENTER — The control room at Sandia’s compound at Tonopah Test Range is the nerve center for communications and data-gathering on the Nevada range. Left to right, Tonopah’s Rick Scarini, now retired; Joe Simile, Glen Watts, Ray Gabaldon, and Stephanie Shreck discuss operations. (Photo by Jim Galli)



That’s that

My wife and I had been talking about it for a long time. It seemed like an awfully big step and we weren’t sure we were ready for it. Our kids had long since done it and most of our neighbors had, too. We didn’t exactly agonize over the issue, but we gave it serious and sustained consideration over the past two or three years. There always seemed a reason to hold off on taking the leap. Finally, this past month when we were making some changes to our cell phone account, we realized it was time to make a decision once and for all: Should we or should we not sever ourselves permanently, totally, and with no going back, from our landline?

Technically, it’s not a tough call; under most circumstances our cell phones are at least as reliable as our land line.

Then there’s the voice quality issue: Sometimes, cell phone-to-cell phone conversations can sound more like field exchanges over walkie talkies than conventional phone conversations. That can be distracting, but that consideration is trumped by the simple financial consideration: Paying for a landline increasingly began to feel like a redundant luxury, something we could do just fine without.

So we took the step and severed the line. And I was surprised at how bittersweet the moment was. It first struck me that something fundamental had changed when I punched in my home number from here at the office to talk to my wife and got one of those messages telling me the number had been disconnected and was no longer in service.

I’d talked to my wife literally thousands of times at that number, one we’d had for decades. Talking via the landline provided a physical, tangible connection – granted, via a network of wires – that imbued each conversation with a sense of closeness and intimacy that seems absent in cell phone conversations, which float somewhere out there in the ether.

Ultimately, we adjusted to the change pretty quickly. What with text messaging and email, we don’t really use the phone that much anyway.

When Alexander Graham Bell finished his prototype of the telephone in 1876, his first words were, “Mr. Watson, come here, I want you.” And the first words ever spoken over a cell phone were from its inventor, Motorola engineer Martin Cooper: “Joel, this is Marty. I’m calling you from a cell phone, a real, handheld, portable cell phone.” That was in 1973.

I don’t remember the exact words of our first cell phone-to-cell phone conversation – it was certainly nothing as profound as the first words ever sent over a telegraph system: “What hath God wrought?” – but I remember what we said about our new arrangement on the first night after we cut the landline: “Did you notice that we haven’t received a single robo-call all day?” Ah, yes.

Finally, regarding telephones, I always think of the late comedian George Carlin’s observation: “What if Alexander Graham Bell’s name were Alexander Graham Siren? The phone wouldn’t ring, it would GO OFF! Martha, the phone’s going off!!”

* * *

With high summer upon us – it’ll be the Fourth of July before we know it – I thought I’d pass along my solution to that perennial challenge of this time of year: picking a ripe, but not too-ripe, watermelon from a bin of identical-looking specimens.

Over the years, I’d heard plenty of suggestions. “Ya gotta find the one with th’ deepest sound. See?” an old timer says in the produce aisle. By way of demonstration he thumps a melon, picks it up, pats it like a doctor waking up a newborn baby and hands it over. “This is a good ‘un.”

And then there’s the melon maven who suggests picking out the one with the highest pitch. The insidious thing is that on occasion either approach seems to work, but not reliably: All too often, the deep-sounding ones are too ripe and mushy, while frequently the high-pitched ones are barely pink, with less sugar content than a potato.

The solution, which seems obvious in retrospect, only came to me in the past couple of years. In any given batch of watermelons, I thump to find the highest and the lowest pitch I can reach without unloading the whole bin (you have to draw the line somewhere). Then I just thump away until I find a melon whose pitch is right in the middle. It’s worked really well so far. Given that we work at Watermelon Lab (yes we have received mail addressed that way), I thought this tidbit would be worth sharing, along with this insight from Mark Twain: “When one has tasted watermelon he knows what the angels eat.”

Happy summer.

See you next time.

– Bill Murphy (MS 1468, 505-845-0845, wtmurph@sandia.gov)

John Dec, Paul Miles receive recognition from ASME

By Michael Padilla




John Dec (8300) and Paul Miles (8362) have received special recognition from the American Society of Mechanical Engineers. John has been selected to receive the 2017 Soichiro Honda Medal, one of ASME’s highest awards, and Paul has been selected to receive the 2017 Internal Combustion Engine Award, also a very prestigious award.



JOHN DEC

contributions to automotive engineering through landmark research and publications on diesel combustion and homogeneous charge compression ignition combustion, which have advanced the understanding of combustion processes and significantly influenced internal combustion engine education and engine design.”

Paul was recognized “for sustained technical accomplishments in the development of optical diagnostics of in-cylinder processes, for improving the understanding of engine fluid mechanics and mixture formation processes, and for vision and leadership in defining and guiding U.S. Department of Energy-funded engine research programs.” Paul, manager of the CRF’s Engine Combustion Department, has actively researched flow, mixing, and combustion processes in reciprocating engines since 1992.



PAUL MILES

John will formally receive his medal and an honorarium at a ceremony in November during the ASME Mechanical Engineering Congress & Exposition in Tampa, Florida. Paul will formally receive his award, which consists of an honorarium and a plaque, during the ASME Internal Combustion Fall Technical Conference in October in Seattle.

Exceptional service in the national interest

Sandia**LabNews**

<http://www.sandia.gov/news/publications/labnews/>

Sandia National Laboratories
Albuquerque, New Mexico 87185-1468
Livermore, California 94550-0969
Tonopah, Nevada • Nevada National Security Site
Amarillo, Texas • Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy’s National Nuclear Security Administration under contract DE-NA0003525.

Bill Murphy, Editor 505/845-0845
Randy Montoya, Photographer 505/844-5605
Patti Koning, California site contact 925/294-4911
Michael Lanigan, Production 505/844-2297

Contributors: Michelle Fleming (Ads, Milepost photos, 844-4902), Neal Singer (845-7078), Stephanie Holinka (284-9227), Darrick Hurst (844-8009), Heather Clark (844-3511), Sue Holmes (844-6362), Nancy Salem (844-2739), Valerie Larkin (284-7879), Lindsey Kibler (844-7988), Tim Deshler (844-2502), Mollie Rappe (844-8220), Kristen Meub (845-7215), Michael Padilla (925-294-2447), Julia Bernstein (925-294-3609), Jim Danneskiold, manager (844-0587)

Classified ads 505/844-4902

Published on alternate Fridays by Internal & Digital Communications Dept. 3651, MS 1468

Retiree deaths

Melvin Pliner (age 95)	March 27
Ernest Sanders (86)	March 30
Tadao Hisaoka (77)	April 1
Vincent Salazar (53)	April 4
William Blythe (91)	April 5
Robert Becker (93)	April 6
Theodore Schmidt (78)	April 12
James Smith (90)	April 14
Kenneth Pilkington (87)	April 16
James Trentham (78)	April 18
Robert Stinebaugh (80)	April 19
Jack Lafleur (96)	April 19
James Davidson (95)	April 20
Raymond Page (65)	April 22
George Urish (78)	April 23
Harold Maciolek (92)	April 23
Clyde Babcock (93)	April 23
Weifang Luo (72)	April 27
Irene Myers (97)	April 28
Edwin Oakes (84)	May 7
Bryan Ewart Arthur (94)	May 8
Luther Otero (84)	May 9
Donald Baumann (84)	May 10
June Brunner (83)	May 10

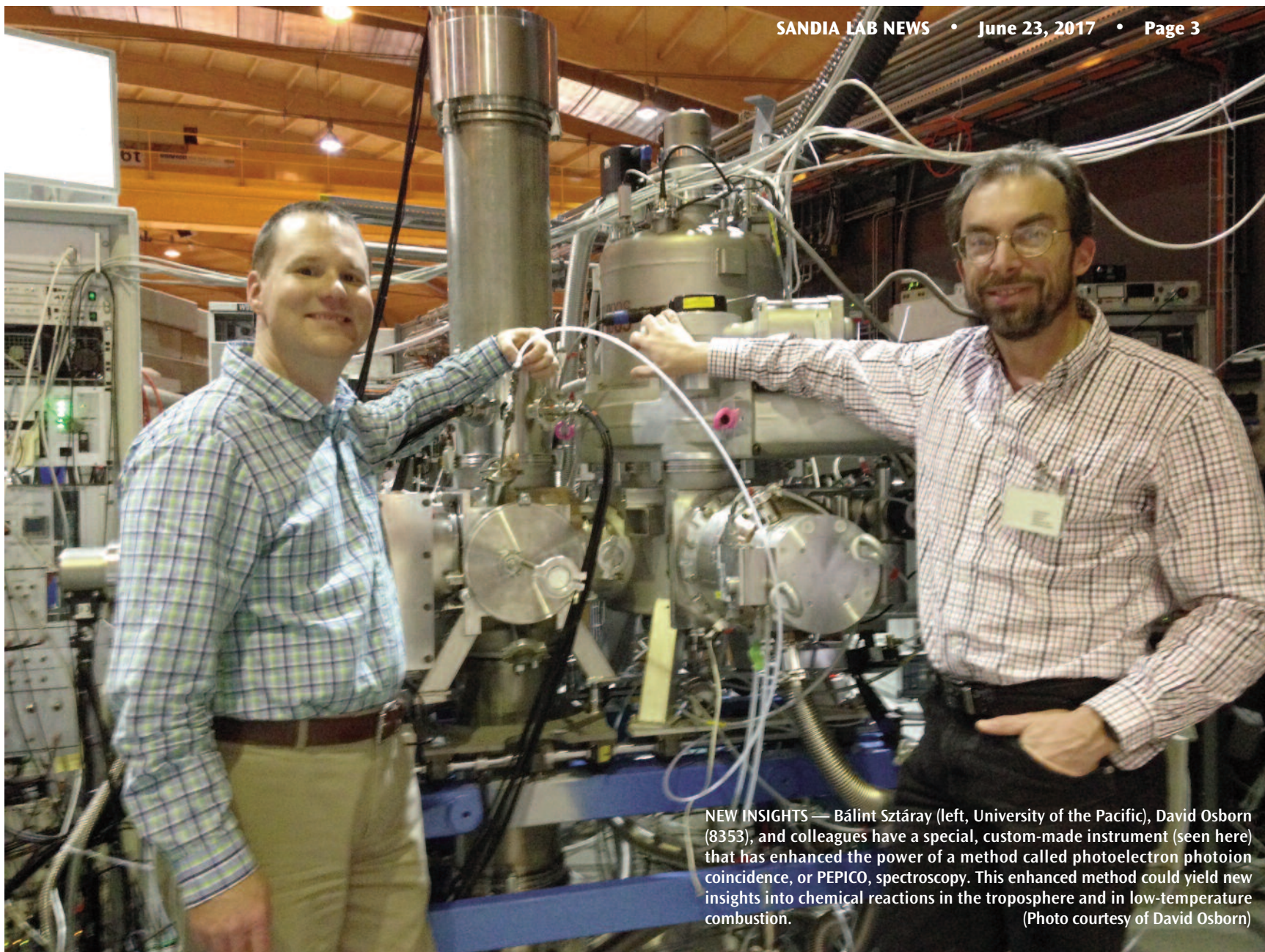
Christopher Rautman (66)	May 12
Randolph Shibata (62)	May 13
Frederick Blottner (85)	May 15
Billy Pontsler (89)	May 24
Eleanor Kelly (97)	May 30
Alma Mischke (95)	May 31
David Edward Henry (93)	June 1

Lab News Reader Service



Retirees (only):
To notify of changes in address, contact Benefits Dept. 3332, Customer Service, at 505-844-4237, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Web users:
The *Lab News* is on the external web at www.sandia.gov/LabNews.



NEW INSIGHTS — Bálint Sztáray (left, University of the Pacific), David Osborn (8353), and colleagues have a special, custom-made instrument (seen here) that has enhanced the power of a method called photoelectron photoion coincidence, or PEPICO, spectroscopy. This enhanced method could yield new insights into chemical reactions in the troposphere and in low-temperature combustion. (Photo courtesy of David Osborn)

Finding a molecular needle in a haystack

By Sarah Sewell

IMAGINE being able to see the entire Statue of Liberty and a small ant on its nose simultaneously. The drastic difference in size between the two objects would seem to render this task impossible.

On a molecular level, this is exactly what a team led by Sandia chemists David Osborn (8353) and Carl Hayden (retired) accomplished with a special, custom-made instrument that has enhanced the power of a method called photoelectron photoion coincidence, or PEPICO, spectroscopy.

This enhanced method could yield new insights into chemical reactions in the troposphere (the lowest layer of the Earth's atmosphere) and in low-temperature combustion. On a more general level, this breakthrough furthers DOE's mission to develop fundamental science underpinning the storage, use, and transformation of chemical energy.

David and Carl conceived the design at Sandia's Combustion Research Facility and tested it alongside Patrick Hemberger and Andras Bodi at Switzerland's Paul Scherrer Institute, in collaboration with Krisztina Voronova and Bálint Sztáray from the University of the Pacific in Stockton, California. This research is part of an ongoing PEPICO spectroscopy collaboration between the three institutions.

Detecting elusive intermediates a challenge with mass spectrometry

David specializes in studying chemical intermediates, molecules that are extremely difficult to find and often present in minuscule quantities, but are key to unlocking chemical reaction mechanisms. These reactions include combustion, atmospheric, and astrochemical, such as in the atmosphere of Titan, Saturn's largest moon, a model for the early Earth.

To analyze chemical intermediates, scientists often rely on special analytical techniques. One of them is mass spectrometry, which measures different molecules in a mixture by detecting their masses.

Chemical intermediates, however, are short-lived, making them difficult or impossible to detect using conventional mass spectrometry methods, especially since they are often hidden in larger mixtures. This is where PEPICO spectroscopy becomes so valuable.

"We are trying to analyze fleeting chemical intermediates. These applications come up a lot in combustion, atmospheric, and catalysis chemistry," David says. "To study these fleeting-reaction intermediates in full detail, we need to know the arrangement of atoms in each molecule — its isomeric composition. Conventional mass spectrometry techniques don't have enough selectivity and speed to accomplish this goal. We made some

innovations in PEPICO to solve these problems."

PEPICO-enhanced mass spectrometry

The PEPICO collaboration among Sandia, the Paul Scherrer Institute, and the University of the Pacific started four years ago when the team succeeded in improving mass spectrometry's selectivity (the ability to distinguish isomers) while maintaining its ability to study dozens of molecules simultaneously.

Sandia creates better 'fingerprints' to detect elusive, valuable chemical compounds

In the first of a series of three papers, the team showed that PEPICO spectroscopy could provide detailed fingerprints of molecules, even in a sample with many chemicals present.

There were a few kinks in the first paper that needed to be worked out. One of the drawbacks to the PEPICO method was that the mass spectrometry signal had a limited dynamic range, meaning that background noise obscured small signals representing tiny amounts of chemical compounds. The PEPICO team knew that "false" coincidence signals in the spectrum create this background noise, but did not have a method to remove this false information.

Based on David's idea of how to solve the problem, the team built a custom mass spectrometer that improved the dynamic range 100-fold, achieving a dynamic range of 100,000 to 1. This improvement is analogous to seeing a large statue and an ant at the same time. Normally, the "signal" of the Statue of Liberty drowns out the signal of the ant. This work was published last October in the *Journal of Chemical Physics*.

A second improvement the team recently made is detailed in the third, most recent publication, where the team demonstrated improved mass resolution of spectrum peaks and the measurement of chemical reaction rates. Previously, PEPICO instruments had been used to study pure compounds, and therefore high mass resolution was not a primary goal.

"When you study one chemical at a time, you don't need to know the mass with much accuracy," David says. "But our goal is to study chemical reactions with many different, unknown products, and that's why we



need good mass resolution in addition to our other requirements."

Through the initial development of PEPICO and its improvements, the team opened doors for a wide variety of applications in which the detection of intermediates and other elusive compounds is essential.

"This prototype is a step up in our instrumentation," David says. "It shows that the final instrument we are constructing now will open our eyes to new intermediates we are still seeking, while giving us deeper insights into the ones we've already studied. The future is very exciting."

Insights in combustion chemistry

One atmospheric chemistry puzzle that David has previously studied is chemical reactions and intermediates in the troposphere. The Criegee intermediate is a key molecule that reacts with atmospheric pollutants and naturally cleans the atmosphere. In the team's most recently published paper, they measured the rate constant (a quantity that represents the speed of a chemical reaction) for a reaction that produces the Criegee intermediate using PEPICO spectroscopy (and agrees with the known, previously established value). Although this intermediate has been detected using previous methods first developed by Sandia, David plans to study Criegee intermediates in more detail using PEPICO.

PEPICO could also provide insight in combustion chemistry. Molecules called hydroperoxyalkyl radicals, QOOH for short, play a key role in low-temperature ("clean") combustion reactions by acting as gate-keeper molecules for speeding up or slowing down chemical reactions. However, QOOH radicals are found only in small amounts and are nearly impossible to characterize using current mass spectroscopy techniques.

David's team was the first to directly observe the kinetics of QOOH in a *Science* paper published two years ago and now hopes to further study the molecules, focusing on how QOOH reacts and changes at widely varying temperatures.

"These intermediates are especially exciting because chemists have speculated they must exist, but no one had ever detected one directly or seen it with spectroscopy until 2015," David says.

By developing and improving PEPICO to measure both the smallest and the largest signals simultaneously, and to measure reaction rates, this new technique will make studying chemical reactions in the lab easier by orders of magnitude.

Tonopah upgrades help Sandia testing

(Continued from page 1)

range has changed the analog brains in instruments to digital, moved to modern communications systems, upgraded telemetry and tracking equipment, and updated computing systems.

Tonopah is the test range for programs that extend the life of the nation’s aging nuclear weapons arsenal. The heart of the range’s far-flung network for tracking and gathering data is the telemetry ground station. Tonopah has two: a primary ground station at the control tower with three antenna dishes and a mobile telemetry trailer with a single antenna dish close to a target area.

More recently, the range added the ability to pipe telemetry data during tests back to Sandia/Albuquerque in real time. First demonstrated in April 2015, it was enabled by Sandia’s copyrighted Telemetry Analysis and Visualization Suite software. Team members in Albuquerque not only received the telemetry data during a March flight test, but saw the same displays of information from various subsystems shown at Tonopah and heard the audio from the control tower.

“That was great,” said Gary Sanders, now-retired vice president of Weapons Engineering & Product Realization. He and other Albuquerque listeners heard reports of the plane taking off, its test passes over the range, and the test director checking in with system operators and range safety. “Plus we had knowledgeable people who told us about the test parameters and what we would be able to see on each telemetry screen. So we were able to watch each of the systems function, which I had never seen before. Two years ago we did not have this real-time telemetry capability. It is phenomenal.”

Eventually: video stream to Sandia Albuquerque

Tonopah took the first step toward the feed a few years ago by delivering still shots from a test to Albuquerque. Eventually, Sandia expects near real-time, fully integrated communications telemetry, including videostream to Albuquerque.

Improvements mean better information processing and more flexibility in accessing and using that information, says Joseph Hasekamp (2324), B61-12 Joint Test Assembly test lead. He’s responsible for coordinating, planning, and executing tests associated with the B61-12 JTA, which contains only non-nuclear components.

“We can see the data remotely, which gives us better access to Tonopah,” he says. “I can sit here in my office in Albuquerque and participate in the range checkout in Tonopah,” a process that tells engineers that systems are functioning in advance of a test.

“It’s one of those situations where we didn’t know how much better we could do our jobs until we had the capability,” Joseph says. “It allows us to do our jobs more efficiently and precisely. It gives us better information and saves taxpayer dollars.”

Gary Ashcraft (2662) says the B61-12 program began using the Telemetry Analysis and Visualization Suite software during telemetry system development and continued using it through ground testing and finally during flight tests and their analysis. “That system development lifecycle support is a key capability of TAVS, and it enables the test-like-you-fly and fly-like-you-test mantra of Org. 2660,” he says.

Telemetry stations gather radio frequency emissions from mock weapons being tested or the airplanes that carry them. Other instruments throughout the 280-square-mile range, including optical tracking telescopes and radars, follow a test unit during flight.

Basic systems haven’t changed, needs have

Basic telemetry systems haven’t changed much in three decades, but the required data rate has, says Sandia/California’s Gary Kirchner (8735), a telemetry expert who travels to Tonopah every couple of months for tests. Telemetry receivers around since the 1980s can perform at up to 2 megabits per second — but today’s tests need data rates of 5 megabits.

“Once the data rates for the B61-12 program were determined, it was clear that all current instrumentation needed extreme maintenance or upgrades,” Gary says. Tonopah replaced recorders, receivers, source selectors, amplifiers, antenna feed assemblies, and hundreds of radio frequency and coaxial cables as well as monitors and other equipment in its four-story Test Operations Center at Sandia’s compound. Most of the equipment replaced was more than 30 years old.

Data tape recorders went first, since magnetic tape was quickly becoming obsolete. Upgrades began in 2007-2008 with six telemetry receivers and four first-generation digital telemetry recorders, one since superseded by a newer generation.

The project replaced four analog reel-to-reel recorders that had 15 minutes of recording time. Mark Skobel (2235), who runs Tonopah’s telemetry operations, says new hard-drive technology provides faster recording and greater storage. It can record 16 analog and 16 digital channels and archive dozens of missions.

Updated receivers and related equipment increased bandwidth and improved data quality. Mark, who began working in telemetry in 2011, says the higher data rates allow engineers to more quickly analyze output from sensors, while other upgrades offer greater detail for analyses. Tonopah installed additional telemetry receivers between 2013 and 2015.

Numerous Tonopah systems upgraded

Three years ago, Tonopah replaced its mobile telemetry trailer with one that has a new antenna system, six telemetry receivers, a telemetry recorder, and ancillary equipment.

About the same time, the range refurbished two tracking antenna dishes at the compound, replaced two antenna control units, and acquired a mobile backup system that eventually will be moved to the range’s east side for better overall reception.

The control room now features dozens of flat-screen color computer monitors that display detailed tracking information — real-time video of tests and telemetry data fed from Tonopah’s Range Acquisition and Control System tracking computers and Test Evaluation Command and Control System. The modern tools replaced black and white screens and analog, push-button equipment so old that range test director Joe Simile (2235) felt he’d stepped back in time and “thought I’d look out and see a Mercury capsule” from NASA’s 1960s-era program.

Construction projects in the tower three years ago and last year “got rid of the old stuff and went digital,” replaced wiring and communications links, and rid the tower of asbestos hazards, Joe says.

The research and development team of Stephanie Shreck (2251), Steve Ohrt, Richard Crowder, and Dave Flegel (all 2235) upgraded, integrated, and validated new systems and closed interoperability gaps that emerged in folding new equipment into a long line of legacy systems.

Just last year, workers installed miles of fiber-optic cable around the vast range.

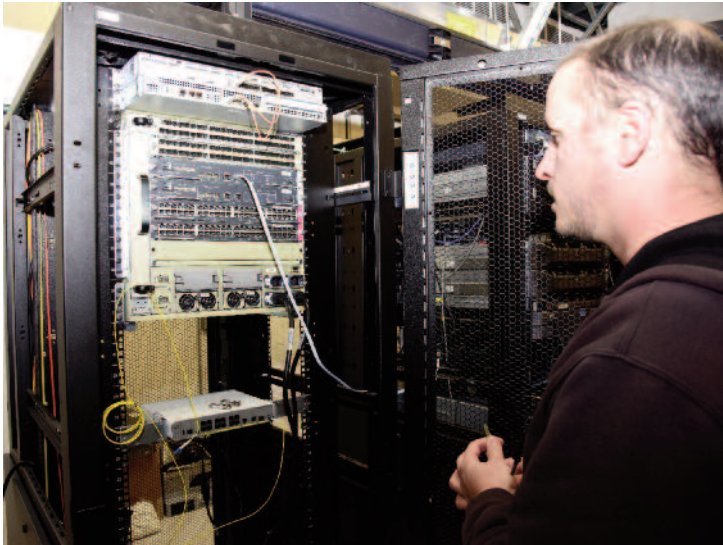
Upgrades extend to field equipment as well. Analog innards have been swapped for digital in Tonopah’s cinetheodolites or cines, combination photo-recording and surveying instruments that look like miniature astronomy observatories and track and photograph targets. Joe says cines were converted two years ago as manufacturers phased out film. In the meantime, Tonopah bought all the film and film-processing chemicals possible so cines could keep shooting until converted.

A 1950s-era tracking telescope built at Sandia’s long-gone foundry on top of an old Navy gun turret looks much like it did originally. But inside, its hydraulic drive has been replaced with a DC drive control system and new high-speed digital camera, says Glen Watts (2235), Tonopah’s technical team lead. The operator in the seat now uses a laptop, joystick, and touch-screen monitor to operate the 117-inch-long telescope.

By fall, the operator on the mount will be gone as well. Tracking equipment now handled by operators at field sites will be controlled by a remote operator at the Test Operations Center.



UPGRADES — The four-story Test Operations Center at Sandia’s Tonopah Test Range compound has been upgraded and updated in recent years. Recorders, receivers, source selectors, amplifiers, antenna feed assemblies, hundreds of radio frequency and coaxial cables, and other equipment have been replaced.



LEE GOODRICH checks over a new fiber optic server at Tonopah Test Range’s data hub. The range has been upgrading and replacing equipment in recent years.



TELEMETRY SYSTEMS TECHNOLOGIST Mark Skobel adjusts patch cords on a panel in the telemetry ground station at Tonopah Test Range. Mark runs telemetry operations for the Nevada range.



A CINETHEODOLITE sits at a remote site at Tonopah Test Range. The range employs about a half-dozen cinetheodolites, telescope-like optical instruments that track accuracy along a trajectory during tests on the range.



OCEAN GOING — Buoys float off the coast of Ilo, Peru, in a 2015 test of a wave energy system developed by the Santa Fe company Atmocean with technical help from Sandia. The system powers a desalination plant that provides coastal cities with fresh water. (Photo courtesy of Atmocean Inc.)

Catch a wave

With technical help from Sandia Labs, a Santa Fe company uses the motion of the ocean to bring fresh water to coastal communities.

By Nancy Salem

Hurricane Katrina whipped up huge, powerful waves that caused severe destruction in 2005 along the US Gulf Coast. Their size and strength convinced Phil Kithil of Santa Fe there had to be a way to harness that energy.

His first thought was a device that would use wave action to pump deep, cold seawater to the surface to dampen the intensity of hurricanes, which thrive on warm water. He proved the concept with a simple tube and one-way valve attached to a buoy, but the idea had no commercial potential as hurricanes are unpredictable.

He thought of a second use because the wave-action pump also brought to the surface concentrated ocean nutrients such as phosphate and silicate that promote the growth of phytoplankton. “Phytoplankton take in carbon dioxide to metabolize nutrients and give off oxygen,” Kithil says. “We felt the pumps had a role to play in climate change mitigation.”

But, again, the business potential evaporated when governments participating in the 2009 United Nations Copenhagen Climate conference did not take action that would open carbon markets for the device.

The third idea was the charm. Kithil and his company, Atmocean Inc. founded in 2006, partnered with the Albuquerque engineering firm Reytek Corp. in 2010 to produce a pump system that uses wave power to send pressurized seawater onto shore where it is desalinated without the use of external energy. Kithil says the system has a simple design and can be set up cheaply and in rural settings to provide fresh water for drinking and farming in coastal cities.

Working with scientists at Sandia Labs through the New Mexico Small Business Assistance (NMSBA) program, the two companies have tested and advanced the technology and moved it close to market by attracting significant investment. “We wouldn’t be where we are today without Sandia’s help through NMSBA,” says Chris White, Atmocean’s chief operating officer. “It provided us with the backbone of validating our technical improvements so we could go forward.”

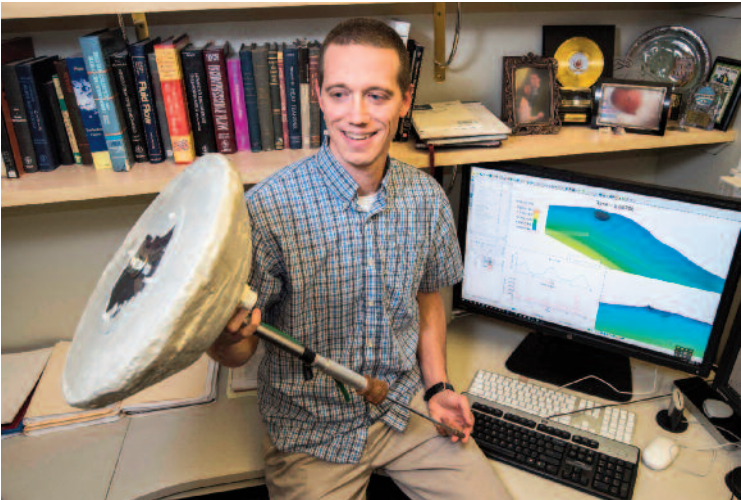
A hand with R&D

NMSBA, a public-private partnership among Sandia, Los Alamos National Laboratory, and the state of New Mexico, lets small business owners who have a technical challenge work with scientists and engineers at the national labs. Created in 2000 by the state Legislature, the program brings world-class technology and expertise to small companies and promotes economic development with an emphasis on rural areas. NMSBA has provided 2,648 small businesses in all 33 of the state’s counties with more than \$53.3 million worth of research hours and materials.

“Many small companies don’t have the resources to do advanced research and development. NMSBA is a great way to give them an R&D hand,” says Jackie Kerby Moore, manager of Technology and Economic Develop-

ment Dept. 1183. “National laboratory expertise helps these people realize their dreams and build their businesses, a win-win for the economy.”

Atmocean recently signed its fourth NMSBA agreement; small businesses can apply for help through the program once a year. Kithil and Phillip Fullam, chief engineer of Reytek, first worked with Sandia’s Rick Givler, a now-retired specialist in modeling physical systems, to assess the feasibility of their near-shore wave energy system. Givler proved that using typical waves and a set number of seawater pumps, considerable pressurized water would reach an onshore reverse



OH BUOY — Sandia mechanical engineer Tim Koehler is using computational fluid dynamics modeling to help the Santa Fe company Atmocean with the design of a buoy — shown here in a miniature prototype — that powers a wave energy system used to desalinate ocean water for coastal cities. He says he enjoys working with private industry through the New Mexico Small Business Assistance program. “It’s been a good process in terms of my personal and professional growth,” he says. “I like the idea. It’s a good way to help rural communities with clean energy technology.”

(Photo by Randy Montoya)

osmosis water purification system.

“We needed to know if we would get a dribble at the end or a gusher of pressurized water,” Kithil says. “Rick came up with the answer — a gusher. If it was a dribble we’d have no business. With a gusher we could estimate expenses and profit. That’s how important the Sandia research was. We could take an interesting idea to business feasibility.”

Sandia’s findings have helped Atmocean attract about \$3.5 million in investment capital to continue product testing, add staff, and boost component manufacturing at Reytek. The company built full-size seawater pumps and tested the system off the coast of Oregon in 2011 and off Peru for six months in 2015. “The first Peru tests were a big success,” Kithil says. “Other small communities want to see if it will work for them.”

Demonstrated in an operational environment

In its latest NMSBA project, Atmocean is working with mechanical engineer Tim Koehler (1513) on computational modeling of the wave energy system. Following trials in a test tank at the Texas A&M University Haynes Laboratory, the system will be deployed later in the year off the coast of Newfoundland for a third round of testing, bringing it to a technology readiness level, or TRL, of seven. There are nine levels in the TRL method of estimating technology maturity. Level seven means the prototype has been demonstrated in an operational environment.

Atmocean’s system is a 200-foot by 200-foot array of pumps floating on the ocean. “Each pump is a buoy on a piston,” Tim says. “As a wave passes, the buoy ingests sea water, and as the buoy settles, it pumps seawater through hydraulic lines back to shore where it enters the zero-electricity desalination process.”

Water arrives onshore at about 180 psi, or pounds per square inch of pressure. Atmocean uses energy recovery devices — essentially spinning mechanical wheels — to boost 14 percent of the arriving seawater to 900 psi, the pressure needed to run reverse osmosis. The RO system is the size of a shipping container and is manufactured by Atmocean industry partners. “We supply the pressurized seawater and we work with standard industry-proven technologies on the desalination,” White says.

The system runs 24/7 and production depends on wave action. White says that in southern Peru, in typical ocean conditions, 50 million cubic feet of pressurized water is pushed to shore in a year. Fourteen percent of that is desalinated, producing 5 million cubic feet of fresh water annually that can be used for agriculture or consumption.

Kithil says the system is inexpensive to operate, offers local employment, and helps the environment. “Each array of pumps creates a defacto marine protected area with artificial structures that see marine growth,” he says. “The system uses small boats operated by local fishermen who get consistent work. During our full-scale pilots in Peru in 2015, we saw a huge outpouring of support from the local fishing community.”

Ocean forces on buoys

Kithil and Fullam are working with Tim to improve the pump design. “They want to know what forces the ocean, through the passage of waves, puts on the buoys, so they can optimize their performance and be as efficient as possible,” Tim says.

He is using computational fluid dynamics modeling to evaluate various buoy designs engineered by Reytek and narrowed down through wave pool tests. “I will give them an idea of ocean forces on various pump designs,” he says.

Tim’s first foray into NMSBA has been eye-opening, he says. “It’s a different application than what I typically work on and uses different software, so it adds some breadth to my experience,” he says. “It’s been a good process in terms of my personal and professional growth. I’m learning more, and it’s nice to help a small business. I like the idea. It’s a good way to help rural communities with clean energy technology.”

After the final demonstration in Newfoundland, Atmocean, which presented the technology at the 2016 United Nations Solutions Summit, will seek a commercial partner. “If all goes well, we’re looking at a year and a half after the tests to reach commercialization,” White says.

Fullam says NMSBA has been critical to the success of Atmocean. “Sandia has resources and experience in areas we don’t,” he says. “The computer modeling tools are something a small company could never afford. We’ve been able to use those resources to answer some rather esoteric questions and generate more questions. The people we’ve dealt with really know what they are doing, and we were able to pinpoint early in the development some key technical issues we wouldn’t have seen. We would have spent a lot of time spinning our wheels. It cut years off the development cycle.”



BUBBLES IN THE PARK — Members of Sandia’s New and Expectant Parents group gathered at a playground for a morning filled with bubbles, music, and companionship.

BUILDING A COMMUNITY OF NEW PARENTS

Sandians share parenting knowledge and support through the New and Expectant Parents group

By Kristen Meub

Warm morning sunshine, streams of bubbles floating through the air, and Disney music greeted the babies, toddlers, preschoolers, and parents who gathered for a recent New and Expectant Parents group social at North Domingo Baca Park.

The event was a chance for new and expectant parents who work at Sandia to bring their children, spouses, and partners out to socialize with other parents and kids. Babies wearing sun hats sat on blankets watching the bubble machines while older children waved bubble wands and ran around the park. For the parents, it was a chance to get out of the house and connect.

“We’re trying to build a community,” Christina Beppler (2555), co-leader and founding member of the New and Expectant Parents group, says. “A lot of people I know are raising kids here without extended family support, and it can also be isolating when you have young kids. You go to work, pick up your kids, you go home, and kids go to bed early. Getting plugged in and meet-

ing other parents can help people to not feel lonely or isolated.”

The group tries to host offsite socials quarterly or more frequently, with an emphasis on choosing times and activities friendly for children from newborn to 5 years old. Past socials have included trips to the Biopark, a splash pad, and Explora.

“The events are fun,” Jimmy Carleton (1446), a core member of the group, says. “It’s good to see other people and their kids in a fun environment and get to know some of the things you can do with kids in Albuquerque.”

The socials are just one aspect of the group. The New and Expectant Parents group hosts monthly informational lunches and built a group SharePoint site with tips, reviews, and recommendations for pediatricians, child care providers, and more.

“We want to ease the transition back to work for new moms and dads, support breastfeeding moms as they provide milk for their babies at work, and be a support for parents as they go through the single biggest transition in their lives,” Christina says. “We’re here for people before they go out on leave, and on the other side of that when they come back to work, we tell them ‘We’re here, we’ve done it, it’s hard, and we are here for you.’”

The group hosts its monthly lunches in Bldg. 831 for both Sandians and their spouses and partners. Each lunch has a topic that the group discusses, and questions and tips are always welcome. Recent topics have focused on summer activities with young children, baby wearing, essential baby and child gear, breastfeeding while working, and navigating holiday travel with young children. Jimmy says he first got involved by attending a monthly lunch.

From sleep to diapers to eating

“I saw it advertised in the *Sandia Daily News* and I just showed up for a lunch,” Jimmy says. “We weren’t even expecting at the time, but we were getting ready and had a lot of questions. I thought it would be a good opportunity to meet people and learn what they know, particularly since we are new to Albuquerque and don’t know anything about daycares or pediatricians in town.

Want to connect

with the New and Expectant Parents Group?

- Visit the SharePoint resource site at <https://parents.sandia.gov/>
- To get notifications about upcoming socials and lunches, sign up for the email distribution list by emailing nep@sandia.gov

It’s been nice to be around other people who are going through the same thing and share tips — anything from sleep to diapers to eating.”

Christina also got involved for similar reasons. “What motivated me was that when I became pregnant with my first child, like many other people I’ve seen, I didn’t have any clue how to get benefits related to pregnancy, how to access community resources, how

to choose a care provider, or where to have my baby,” Christina says. “And beyond that, my maternity leave was pretty rocky because I just didn’t know how to downshift from working 40 hours a week and then staying with a baby at home.”

While Sandia’s leave benefit department handles pregnancy, adoption, and foster parent benefits processes and questions, the New and Expectant Parent group is a peer-to-peer networking and support group where parents can discuss parenting strategies and experiences that have worked for their families. The group’s SharePoint research site serves as an extension of the monthly lunches and provides a place for parents

to leave reviews of childcare providers and pediatricians, suggest family-friendly activities, restaurants, and businesses, ask questions of the group, share breastfeeding support information, discuss work-life balance strategies, and swap gear. It also has information for expecting parents and parents of multiples.

“We went to a lot of daycares and interviewed a lot of pediatricians,” Jimmy says. “It was nice to be able to weed out the bad ones right from the start and not even consider those while also getting recommendations on good options.”



IT’S ALL HAPPENING AT THE ZOO — Members of Sandia’s New and Expectant Parents group met at the zoo for a baby- and toddler-friendly social event.

Looking for information

about Sandia’s benefits for pregnancy, adoption, and foster parents?

- Visit hbe.sandia.gov and look for information about Sandia’s Expectant Parent Program
- Attend one of the Expectant Parent Program information sessions, held in Bldg. 832, Rm. 31, every 1st and 3rd Wednesday of the month, 1:30-3 p.m.
- Call HR Benefits Customer Service at 844-4237, option 2 for assistance

SANDIA CLASSIFIED ADS

MISCELLANEOUS

CAR DOOR SPEAKERS, 2, slightly used, Memphis Audio 15-SRX62, 6-1/2", 2-way coaxial, \$15. Jensen, 821-2373.

TREADMILL, Vision Fitness T9200, premier console, quick speed & elevation, heart rate sensors, more, w/owner's manual, brand new condition, paid \$2,000, asking \$800. Mann, 505-228-8869, ask for Patti.

MODEM/ROUTER, NetGear NightHawk, model D7000 VDSL/ADSL, extreme speed & range, never used, in box, \$135. Patton, 379-3287.

COFFEE CANS, 13 oz., w/plastic lids, clean, free; large glass jars w/metal lids, clean, free; weed burner, hand-held propane, \$5; lounge chair, fold-up, \$15. Lewis, 505-323-7268.

FLATWARE, gold-plated, 63-pc., service for 12, in original sealed plastic pouches, \$350. Tirado, 505-615-9474.

REMODELING SALE, kitchen cabinets, trash compactor, gas stove, furnace, wall heaters, light fixtures. Mozley, 884-3453.

DROP-LEAF TABLE, 48-in. diameter, Pottery Barn, Shayne, w/4 Napoleon chairs, white, \$600. Krok, 626-676-1052.

TIMESHARE, beautiful Steamboat Springs, CO, sleeps 6, fully furnished, Aug. 19, 1 wk., \$700. Buck, 353-2667.

GUITAR, Gibson Les Paul Special SL, mid-2000s, natural finish, SKB case, excellent condition, \$635. Kunstadt, 690-9033, text preferred.

ELECTRIC DRYER, \$150; air conditioner, in-room, \$125; table, wood, drop-leaf, 42-in., \$150. Baggett, 505-463-4260.

MASSAGE CHAIR, zero gravity, Osaka model OS4000, like new, purchased in '14 for \$2,500, asking \$1,200 OBO, you haul. Griego, 505-514-2783.

HOT TUB, '16 Bullfront A7 series, w/cover, great condition, all-ways under covered patio, extra jet, \$9,000. Candelaria, 505-730-5933.

ANTIQUE CLOCKS, weight & spring driven, mantel & wall, working, serviced, nice condition. Ross, 332-0659.

SURROUND SOUND SYSTEM, Panasonic, Dolby 5.1, 5-disc CD, receiver, grey, \$100 OBO. Schoenherr, 920-918-2634.

LADDER, aluminum, 15-ft., \$50; RV camping equipment, many items; air compressor, \$70; assorted tools, grinder, skill saws, many assorted tools. Garcia, 505-554-2690.

TRANSPORTATION

'07 GMC 2500HD DURAMAX SLT LBZ, 4x4, Allison 6-spd. AT, loaded, 88K miles, \$28,000. Sanchez, 505-363-1918.

'12 HONDA CIVIC LX COUP, 2-dr., AT, 5-spd., 31-mpg, 70K miles, \$10,000 OBO. Wilson, 505-362-4394.

RECREATION

INFLATABLE KAYAK, advanced frame, sets up in minutes, stores compact, w/carry duffel bag, breathable foam mesh back support, padded seat, more, \$450 new, asking \$150. Dwyer, 505-294-4275.

'14 HARLEY-DAVIDSON STREET-GLIDE, extras, 7,200 miles, \$16,500. Martinez, 480-5099.

'15 BMW G650GS, low suspension, heated grips, center stand, Givi case, great commuter, 2,366 miles, \$5,900. White, 238-2437.

'12 TTLR, 26 BH, new axial, tires, rims, kitchen cushions, stereo, batteries, kitchen faucet, queen mattress, rifle rack, \$15,500 OBO. Barreras, 505-604-8671.

REAL ESTATE

5-BDR. HOME, 3 baths, 4,280-sq. ft., separate in-law quarters, swimming pool, 817 Lamp Post, \$455,000, will negotiate. Ramos, 972-951-0290.

2-BDR. HOME, 1 bath, 800-sq. ft., new bathroom, updated kitchen, south UNM area, \$169,000. Prior, 505-239-9586.

4-BDR. HOME, 3 baths, 3,000-sq. ft., new high-efficiency green home, close to base, Volterra, MLS#893720, \$310,000. Dubuque, 505-280-3132.

WANTED

CAR FOR STUDENT, 4-dr., PL, PW, good gas mileage, AT, <\$6,000. Ashby, 281-1573.

SMALL DINING TABLE, good condition, w/2-4 chairs, for apartment. Black, 505-331-9147.

GOOD HOME, cat, 4 yrs. old, black, current shots, basic supplies provided. Jackson, 505-417-9045.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday.

Submit by one of these methods:

- EMAIL: Michelle Fleming (classads@sandia.gov)
- FAX: 844-0645
- MAIL: MS 1468 (Dept. 3651)
- INTERNAL WEB: On internal web homepage, click on News Center, then on Lab News link, and then on the very top of Lab News homepage "Submit a Classified Ad."

If you have questions, call Michelle at 844-4902.

Because of space constraints, ads will be printed on a first-come basis.

Ad rules

1. Limit 18 words, including last name and home phone (If you include a web or e-mail address, it will count as two or three words, depending on length of the address.)
2. Include organization and full name with the ad submission.
3. Submit ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active Sandia members of the workforce, retired Sandians, and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish any ad that may be considered offensive or in bad taste.

Weapon Intern Program open for nominations for new class

By Sue Major Holmes

Nominations are due July 14 for the upcoming Weapon Intern Program class, aimed at passing along decades of weapons-related knowledge to a new generation of nuclear weaponeers.

Sandia created the intern program in 1998 as a formal way to transfer weapons knowledge and experience and increase the understanding of those new to the nuclear weapons field. Since then, 423 people have graduated from the program and a new class of 21 is set to graduate Aug. 31. Graduates have come not only from Sandia, but also from NNSA, Air Force, Navy, Kansas City National Security Campus, Pantex, and other labs.

The next class, the 23rd since the program began, will start Sept. 25 and run for 11 months. For more information, go to the program's website at wip.sandia.gov.

The ideal candidate has at least a bachelor's degree — a graduate degree is preferred — in an engineering or scientific discipline and two to five years of experience in nuclear weapons, says Weapon Intern Program manager Larry Schoof (2236).

"It's the only program of its kind in the Nuclear Security Enterprise, and most alumni of the program describe it as a 'once in a career' opportunity," he says.

Graduate Alan Sonntag (9421) says the program gave him a better understanding of the roles and capabilities of Sandia departments and other sites. "The knowledge and networking gained in the WIP continue to prove invaluable to the work I do and make meaningful contributions to the US nuclear deterrent," he says.

And graduate Steven Trujillo (0151) says the experience "was clearly pivotal in my career. I feel that my ability to perform in each new job I've had can be traced to the breadth of instruction and understanding I received in the program."

Program aims to develop technical leadership

Although many graduates move into management, the intent is to develop technical leadership, Larry says. Graduates have held leadership roles in the past few years in various Sandia nuclear weapons programs, including weapon system lead, product realization team lead, weapon control unit technical lead, Technical Basis Realization Team lead, Weapon Assess-



A WEAPON INTERN PROGRAM class reviews the drop of a mock weapon at Sandia's Tonopah Test Range in Nevada. The WIP curriculum includes lectures, briefings, and site visits that reinforce classroom work and allow the interns to see the overall nuclear enterprise. (Photo courtesy of Dept. 2236)

ment Team lead, project lead, and arming, fuzing, and firing mechanical team lead.

The curriculum includes classroom lectures, briefings, numerous projects, and site visits. The visits reinforce classroom instruction and allow interns to see the overall nuclear enterprise, gain a greater appreciation of how each site contributes, see other perspectives, and appreciate what each site does within its constraints and requirements.

Interns spend six months in intensive classroom work covering nuclear policy and history, requirements, science and technology foundations, design and assessment, nuclear components, non-nuclear components, and systems. During the final five months, interns are embedded in Sandia organizations to work on nuclear weapons-specific projects. That gives them a chance to put into practice some of the concepts they learned in the first six months.

Each intern completes three classroom projects that reinforce lessons, help them develop depth and breadth in nuclear weapons knowledge, and develop networks vital to their career.

The program conducted two classes annually from 2014 to 2016 to meet demand, then scaled back to one a year to accommodate a new course for managers called Essential Topics for NW Management, Larry says.

An independent review of the WIP, underway as part of continuous improvement, is expected to conclude soon. The initial feedback has been positive and reinforced the program's value, says senior manager Bernard Gomez (2230). "We do expect some modest

changes to the curriculum to provide broader context for the future stockpile while retaining the foundational core that has proven to be so successful," he says.

WEAPON INTERN PROGRAM

2018 NOMINATIONS

Nominations for 2018 are now being accepted through July 14, 2017.

Providing the nation with preeminent staff for innovation, technical leadership, program management and responsive stewardship, for our Nuclear Security Enterprise.

WIP Contact Information: Robert Tachau, Department 2236 Manager, 505.845.7157, rdtacha@sandia.gov

Larry Schoof, WIP Project Lead, 505.844.5156, laschoo@sandia.gov

<http://wip.sandia.gov>

Sandia National Laboratories

Sandia marks Pride Month

Why we care: from Scare to SPAN

By Michele Kahn

Last week, the Sandia Pride Alliance Network (SPAN) hosted a presentation and discussion about the Lavender Scare, a 1950s-era purge of lesbian, gay, bisexual, and transgender (LGBT) individuals from the State Department and other government agencies.

The Lavender Scare still looms large for LGBT individuals today. Legal persecution and firing of LGBT government employees continued until 1995 when President Clinton signed Executive Order 12986, adding sexual orientation to the anti-discrimination statement for granting access to classified information. Furthermore, LGBT Sandians who also served in the military had to remain closeted until 2010 when President Obama repealed the “Don’t ask, don’t tell” policy.



MICHELE KAHN

Working on the Lavender Scare presentation with my SPAN colleagues helped me appreciate how far Sandia Labs has come in its journey to become a more welcoming place for LGBT employees. I would like to share my perspective on the culture shift during my 25 years at Sandia’s California lab.

Tepid welcome

Prior to starting at Sandia Labs in 1992, I worked for 13 years at AT&T, the managing and operating contractor at the time. Sandia Labs was seen as the place to work because of its resources and missions, so I was

thrilled with the new job opportunity. I had been openly gay at AT&T with no issues whatsoever. Naively, I assumed that other workplaces would be just as accepting. This illusion was shattered at the start of my security clearance investigation, which zeroed in on my sexual orientation. I even had to call my mother in front of the investigator to prove that I was out to my family. The investigators asked me to name my current and past partners. In the early 1990s, LGBT individuals were far more likely to be closeted than out. Just marching in a pride parade was an act of courage. For many of my friends, being questioned about their sexual orientation by a government representative was downright terrifying.

A networking group of our own

Don Hall and Darla Granzow founded the LGB employee networking group (no “T”s were openly recognized at the time) at Sandia’s California lab. Very few LGBT individuals were out at Sandia Labs, so our group was extremely cautious. Meetings had generic titles to avoid accidentally outing members when others viewed their calendars. People worried that associating with the LGB group would negatively impact their careers.

This atmosphere continued into the early 2000s. Many Sandians out in their personal lives stayed closeted at work for fear of discrimination. Being closeted requires constantly acting like someone you are not – choosing words carefully, avoiding gendered pronouns,

being conscious of body language, and taking extra care when mentioning places you’ve visited or events you’ve attended. For some, it was easier to lie and refer to a husband or wife instead of a same-sex partner. One colleague, after a very long career at Sandia



ISLAND TIME — Michele Kahn and wife Jennifer in a recent photo.

Labs, decided to come out in his last year before retirement. I was honored when he said he was inspired by my example. That someone older and more experienced would look to me as a leader was profound. After coming out at work, he said his work life changed drastically for the better. He had felt tense and anxious every day about being outed — guarding himself against revealing personal details and hiding his true reactions to offensive jokes and statements. He realized how much emotional energy maintaining this façade had consumed. Seeing what a difference this made for him, even for a year, has motivated me to continue being brave and working to push the culture.

ABQ Pride Parade

KEEPING COOL AT PRIDE —Sandia Pride Alliance Network’s Chris LaFleur (8851, below) was all smiles, despite sweltering heat, at the city’s Pride Parade June 10.



Photo by Lindsey Kibler



Photo by Lindsey Kibler

ASSOCIATE LABS DIRECTOR Mark Sellers (9000), General Counsel Will Elias (11000), and Associate Labs Director Scott Aeilts (10000) (second, third, and fourth from left in background of photo below) joined Sandia Pride Alliance Network (SPAN) members and volunteers June 9 at the group’s decorating event for the Labs’ annual Pride float. Deputy Labs Director Dave Douglass also stopped by to express his support and appreciation for the group. “I am proud of the important work you do every day in ensuring that our Laboratories present a welcoming and accepting environment for all individuals,” Labs Director Steve Younger said in a message to SPAN members. “I am equally proud that you will be representing Sandia National Laboratories in the greater Albuquerque community.” SPAN began in 1987 when employees met under the name Q-Lambda. In 1995, it became a formal networking group whose vision is to develop a safe, hospitable, supportive, and productive workplace for all employees regardless of sexual orientation, gender identity, gender expression, race, national origin, ethnicity, religion, age, veteran status, physical/mental abilities, and marital status.